IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	A. SARIEL, et al.
Serial Number:	09/926,547
Filed:	March 5, 2002
Title:	IMAGE COMPRESSION
Art Unit:	2627
Examiner:	BAYAT, ALI

Mail Stop Amendment
Honorable Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE TO OFFICE ACTION

Sir:

In response to the Office Action dated December 9, 2005 for the above noted application, the applicant submits the present amendment and accompanying Remarks.

IN THE CLAIMS

Please amend the claims as indicated in the claim listing below.

1. (Currently amended) A method of data processing, comprising:

providing image-data in an image space that ~~encoding~~ encodes light as a spaced-apart discrete input set with dead spaces between all input set elements wherein each element is windowed by a first window function;

transforming said light from ~~an~~ the image space to a transform space utilizing a continuous optical Fourier transforming component ~~to apply a discrete linear transform to said input discrete data set, which transform generates coefficients that inter-relate a plurality of input set elements~~; and

windowing spatially discrete regions in the transform space with a second window function that is related to the first window function by a matching condition so that at least one of intensities and phases of transformed light in the transform space regions are proportional to coefficients of a discrete transform of the input set; and

detecting data carried by said transformed light ~~as discrete data, by aat~~ the spatially discrete sampler which ~~detects spaced apart samples~~ regions.

2-3 (Cancelled)

4. (Currently amended) A method according to claim 1, wherein windowing ~~comprising~~ comprises ~~matching said continuos component to a discretization behavior of said discrete sampler~~ using a matching component.

5-7 Cancelled)

8. (Previously presented) A method according to claim 1, comprising compressing or decompressing said data using a transform-type compression/decompression method that uses said transforming.

9-10 (Cancelled)

11. (Previously presented) A method according to claim 8, wherein said transforming comprises transforming using one or more optical elements which perform a block transform.

12. (Original) A method according to claim 11, wherein said one or more optical elements comprises a matrix of optical lens elements.

13 (Cancelled)

14. (Original)A method according to claim 11, wherein said one or more optical elements comprises an element which performs a vector by matrix multiplication.

15. (Original)A method according to claim 11, wherein said one or more optical element comprises a refractive element.

16. (Original)A method according to claim 15, wherein said refractive element comprises a bi-refringent material.

17 (Cancelled)

18. (Original) A method according to claim 11, wherein said one or more optical elements comprises an element which generates a matrix product.

19. (Original) A method according to claim 18, wherein said matrix product comprises a triple matrix product.

20 (Cancelled)

21. (Previously presented) A method according to claim 8, wherein said compression is a JPEG compression.

22. (Previously presented) A method according to claim 8, wherein said compression is a MPEG compression.

23. (Previously presented) A method according to claim 8, wherein said compression is a wavelet compression.

24. (Previously presented) A method according to claim 8, wherein said data represents an image sequence.

25 -33 (Cancelled)

34. (Previously presented) A method according to claim 1, comprising post-processing said data to generate data that represents a transform other than a Fourier transform.

35. (Original) A method according to claim 34, wherein said postprocessing comprises optically postprocessing

36. (Previously presented) A method according to claim 34, wherein said postprocessing comprises spatially modulating said light.

37 (Cancelled)

38. (Previously presented) A method according to claim 34, wherein said preprocessing comprises mirroring said data.

39. (Original) Apparatus for optically processing data, comprising:

an input for receiving data;

a spatially modulated light source responsive to said input, for presenting said input as a spaced apart discrete input set with dead spaces between all input set elements;

at least one continuous Fourier transforming optical component for transforming said data between an image space and a transform space, using a two dimensional signed discrete linear transform; and

a spatially discrete sampler for sampling at locations corresponding to said discrete transform.

40. (Original) Apparatus according to claim 39, wherein said received data comprises uncompressed image data and comprising a processor for processing said data after said transform to yield compressed image data to be outputted.

41. (Original) Apparatus according to claim 39, wherein said received data comprises compressed image data and comprising a processor for processing said data before said transform to yield transform data to be transformed by said optical component.

42-43 (Cancelled)

44. (Previously presented) Apparatus according to claim 40, wherein said processor performs at least some of its processing on optic waves.

45. (Previously presented) Apparatus according to claim 40, wherein said processor performs at least some of its processing on electronic signals.

46. (Previously presented) Apparatus according to claim 39, comprising an optical motion estimator.

47. Apparatus according to claim 46, wherein said optical motion estimator utilizes said optical component for optical motion estimation.

48. (Previously presented) Apparatus according to claim 46, wherein said optical motion estimator includes at least one electronic component.

49. (Previously presented) Apparatus according to claim 39, comprising an optical motion compensator.

50 (Cancelled)

51. (Previously presented) Apparatus according to claim 49, wherein said optical motion compensator includes at least one electronic component.

52-54 (Cancelled)

55. (Previously presented) Apparatus according to claim 39, wherein said data comprises an image sequence.

56 (Cancelled)

57. (Previously presented) Apparatus according to claim 39, wherein said data is manipulated as blocks.

58-59 (Cancelled)

60. (Previously presented) Apparatus according to claim 39, wherein said optical component comprises a holographic lens.

61-62 (Cancelled)

63. (Previously presented) Apparatus according to claim 39, wherein said optical component comprises a matrix product calculating element.

64. (Previously presented) Apparatus according to claim 39, wherein said light source comprises a binary SLM (spatial light modulator).

65. (Previously presented) Apparatus according to claim 39, wherein said input is matched to said output to account for non-point light sources and detectors.

66. (Previously presented) Apparatus according to claim 39, wherein said apparatus processes a plurality of data blocks in parallel.

67. (Original) Apparatus according to claim 66, wherein different data blocks are encoded differently, to reduce cross-talk between them.

68-69 (Cancelled)

70. (Previously presented) Apparatus according to claim 66, comprising light attenuators arranged to attenuate light leaking between areas processing different data blocks.

71-73 (Cancelled)

74. (Previously presented) Apparatus according to claim 39, wherein said optical component comprises a bi-refringent material.

75-76 (Cancelled)

77. (Previously presented) Apparatus according to claim 39, wherein said input receives light waves from an imaged object and wherein said input spatially samples said light.

78. (Original) Apparatus according to claim 77, comprising a detector that converts said data into electrical signals

79 (Cancelled)

80. (Original) Apparatus according to claim 78, comprising an electronic quantizer which quantizes said electronic signals to produce compressed data.

81-82 (Cancelled)

83. (Previously presented) Apparatus according to claim 77, comprising a storage unit for storing at least one set of said electronic signals, corresponding to an image sequence.

84-89 (Cancelled)

90. (Original) A single integrated multi-block-transform optical element, comprising:

a plurality of optical groups each group comprising at least one optical sub-element,

wherein each of said optical groups optically transforms a block of data using a signed linear discrete transform,

wherein said block is part of a data set divided into blocks for block-transforming, including at least one other block being transformed in parallel by another optical group of said integrated element and

said data is arranged as a spatially impulse image.

91-92 (Cancelled)

93. (Previously presented) An element according to claim 90, wherein said optical groups perform said transforming using a discrete optical component that applies a transform.

94 (Cancelled)

95. (Previously presented) An element according to claim 90, wherein said at least one sub-element comprises a lenslet array portion.

96. (Previously presented) An element according to claim 90, wherein said plurality of optical groups are arranged as a matrix.

97-99 (Cancelled)

100. (Previously presented) An element according to claim 90, wherein said transform comprises a non-separable transform.

101-102 (Cancelled)

REMARKS

Claims 1, 4, 8, 11, 12, 14-16, 18, 19, 21-24, 34-36, 38-41, 44-49, 51, 55, 57, 60, 63,-67, 70, 74, 77, 78, 80, 83, 90, 93-96, and 100 are currently pending. Of the pending claims, claims 1, 39 and 90 are independent claims. In the current Office Action claims 39-41, 44-46, 48, 49, 51, 55, 57, 60, 63-67, 70, 74, 77, 78, 83, 90, 93-96 and 100 are allowed. Claims 1, 4, 8, 11, 15, 16, 18, 19, 21-24, 34-36 and 38 are rejected under 35 U.S.C. 103(a) as being obvious in view of US 6,529,614 to Chao et al in view of US 5,867,368 to Hoffberg et al.

Applicant notes that claims 20 and 94 are mistakenly listed in the Office Action as pending and claims 47 and 80 as being cancelled. Applicants request that the mistake in the listing be corrected.

In the present amendment claims 1 and 4 are amended.

Claim 1 is amended to recite the limitation that the input set elements are windowed by a first window function and that spatially discrete regions of the transform space are windowed with a second window function which window functions are related by a matching condition so that at least one of intensities and phases of transformed light in the transform space regions are proportional to coefficients of a discrete transform of the input set. The limitations of amended claim 1 are supported by equations (2) - (23) in the specification and the discussion thereof (*e.g.* pages 19-24). The first window function is referred to in the specification as the function l(x) (page 21, line 19) and the second window function is noted in the specification as W(u) (pg. 22 line 4).

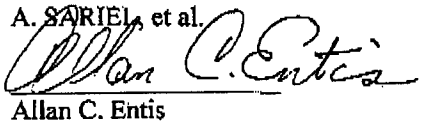
Claim 4 is amended to conform the language of the claim to the change in claim 1. Neither Chao et al nor Hoffberg et al teach such a windowing relation and applicants therefore submit that claim 1 is patentable over the cited art. Claims dependent on claim 1 are patentable at least through their dependence on claim 1.

In view of the above, applicants feel that all the claims in the amended claim set are patentable and respectfully request allowance. If the Examiner feels that allowance is not warranted, applicants respectfully request that the Examiner call the undersigned to discuss the application.

May 8, 2006

Respectfully submitted,

A. SARIEL, et al.



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